FIG. 1

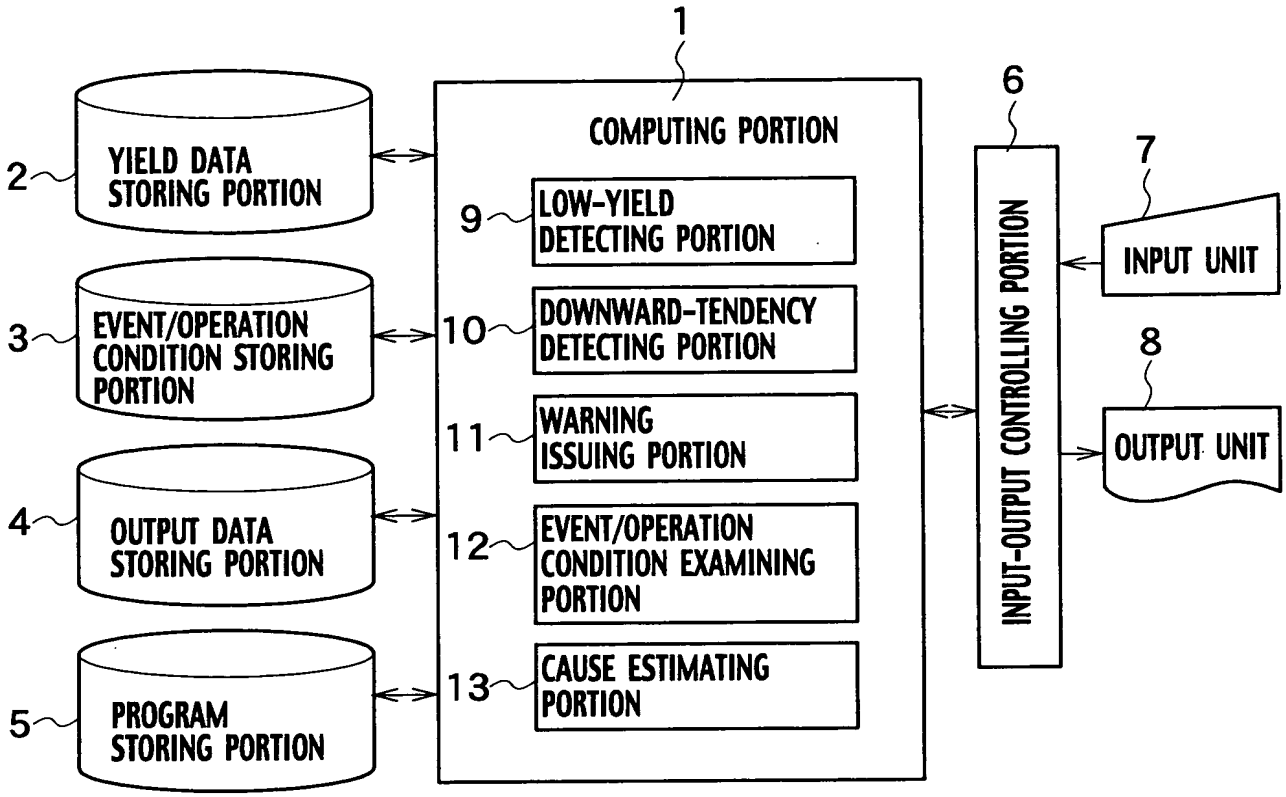
1
COMPUTING PORTION
2
YIELD DATA STORING PORTION
3
EVENT/OPERATION CONDITION STORING PORTION
4
OUTPUT DATA STORING PORTION
5
PROGRAM STORING PORTION
9
LOW-YIELD DETECTING PORTION
10
DOWNWARD-TENDENCY DETECTING PORTION
11
WARNING ISSUING PORTION
12
EVENT/OPERATION CONDITION EXAMINING PORTION
13
CAUSE ESTIMATING PORTION
6
INPUT-OUTPUT CONTROLLING PORTION
7
INPUT UNIT
8
OUTPUT UNIT

FIG. 2

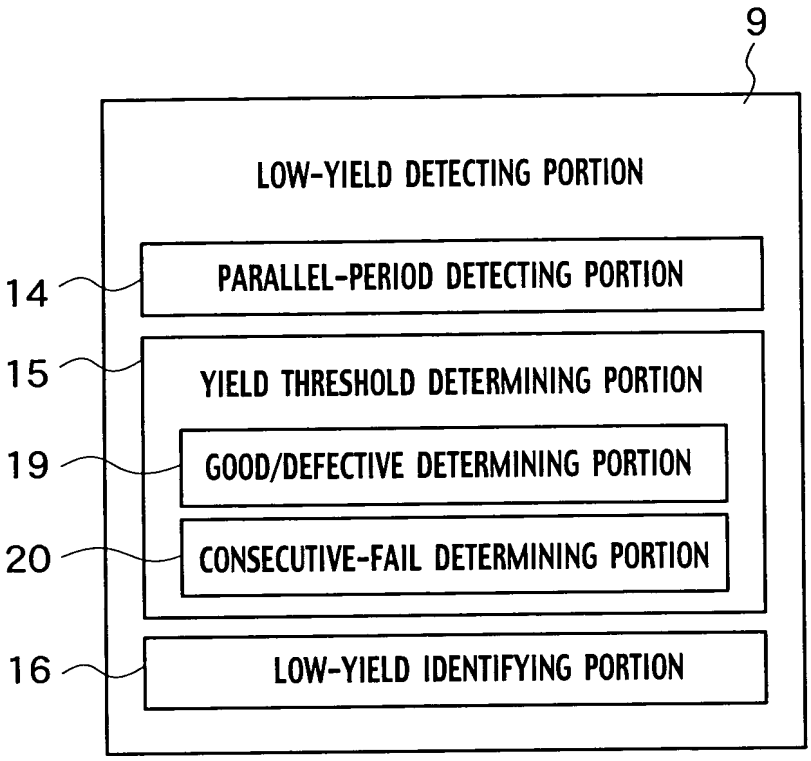
9
LOW-YIELD DETECTING PORTION
14
PARALLEL-PERIOD DETECTING PORTION
15
YIELD THRESHOLD DETERMINING PORTION
19
GOOD/DEFECTIVE DETERMINING PORTION
20
CONSECUTIVE-FAIL DETERMINING PORTION
16
LOW-YIELD IDENTIFYING PORTION

FIG. 3

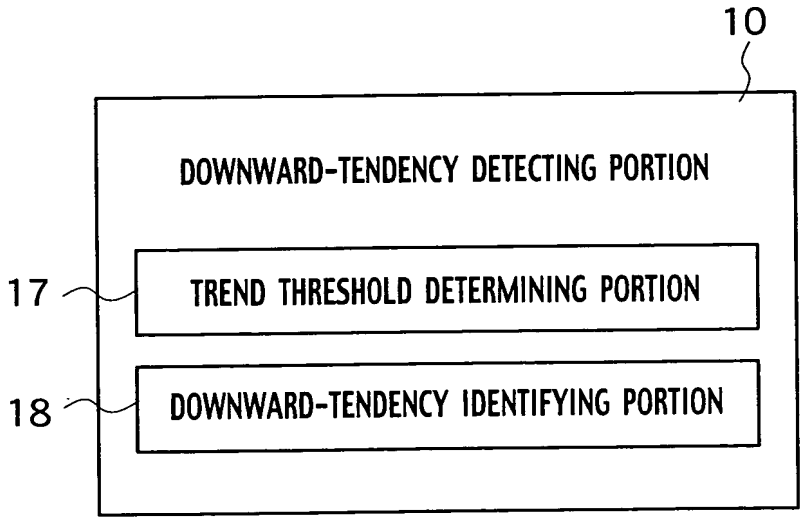
10
DOWNWARD-TENDENCY DETECTING PORTION
17
TREND THRESHOLD DETERMINING PORTION
18
DOWNWARD-TENDENCY IDENTIFYING PORTION

FIG. 4A

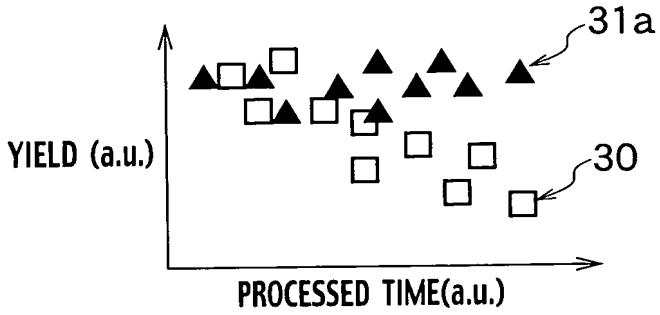

FIG. 4B

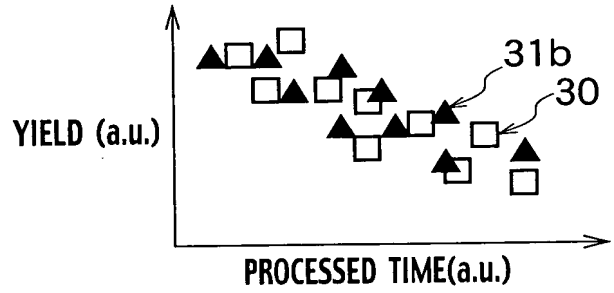

FIG. 5

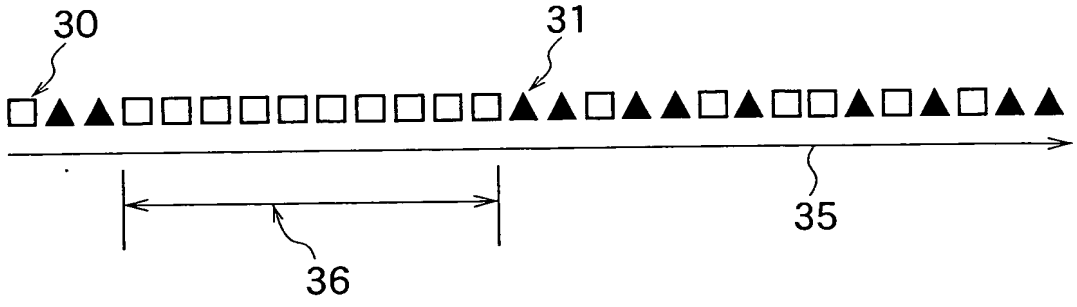

FIG. 6

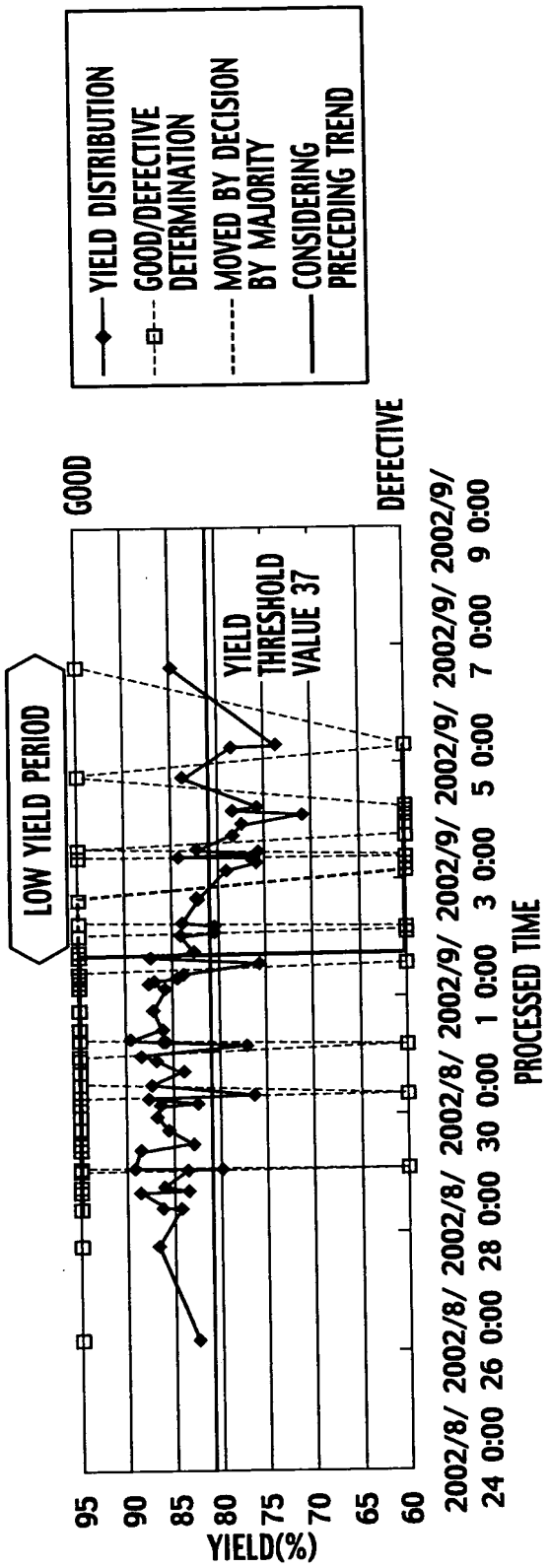
YIELD DISTRIBUTION
GOOD/DEFECTIVE DETERMINATION
MOVED BY DECISION BY MAJORITY
CONSIDERING PRECEDING TREND
GOOD
DEFECTIVE
LOW YIELD PERIOD
YIELD THRESHOLD VALUE 37
95
90
85
80
75
70
65
60
YIELD(%)
2002/8/ 24 0:00
2002/8/ 26 0:00
2002/8/ 28 0:00
2002/8/ 30 0:00
2002/9/ 1 0:00
2002/9/ 3 0:00
2002/9/ 5 0:00
2002/9/ 7 0:00
2002/9/ 9 0:00
PROCESSED TIME

FIG. 7

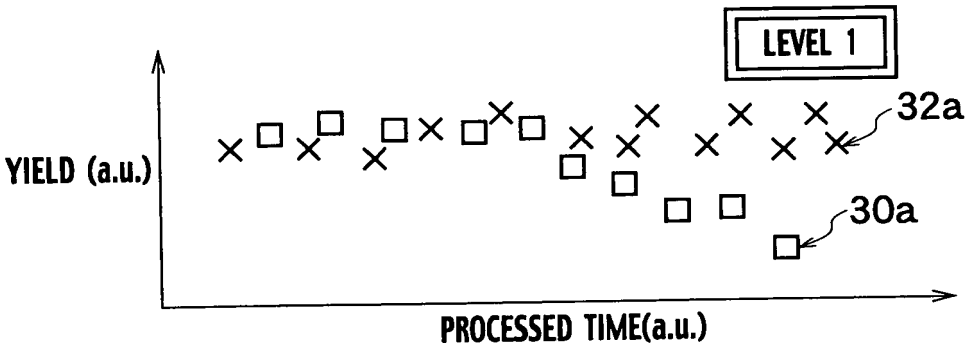
LEVEL 1
32a
30a
YIELD (a.u.)
PROCESSED TIME(a.u.)

FIG. 8

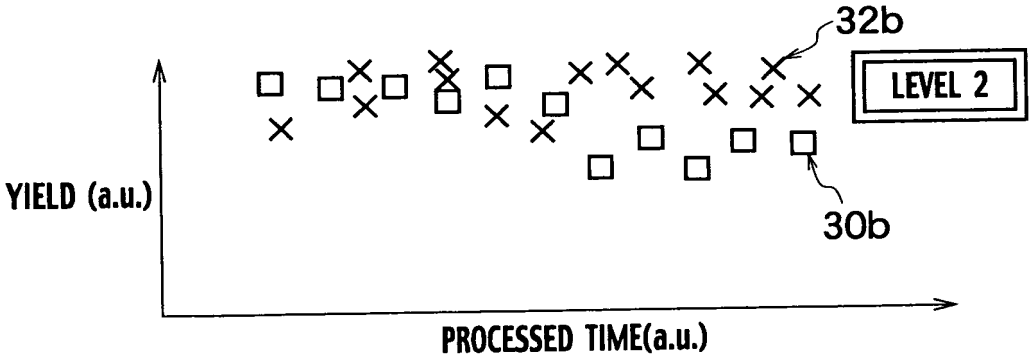
32b
LEVEL 2
30b
YIELD (a.u.)
PROCESSED TIME(a.u.)

FIG. 9A

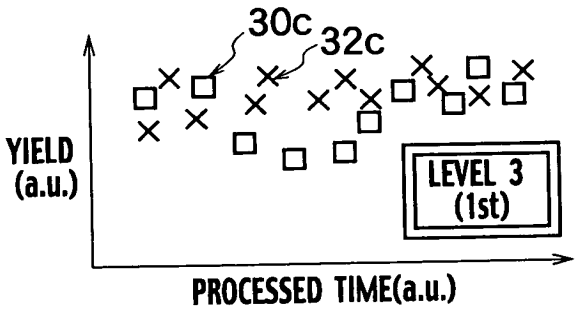

FIG. 9B

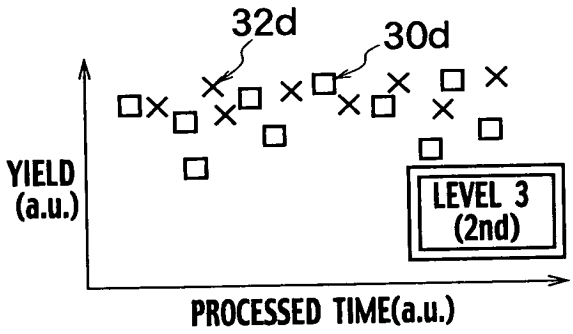

FIG. 10

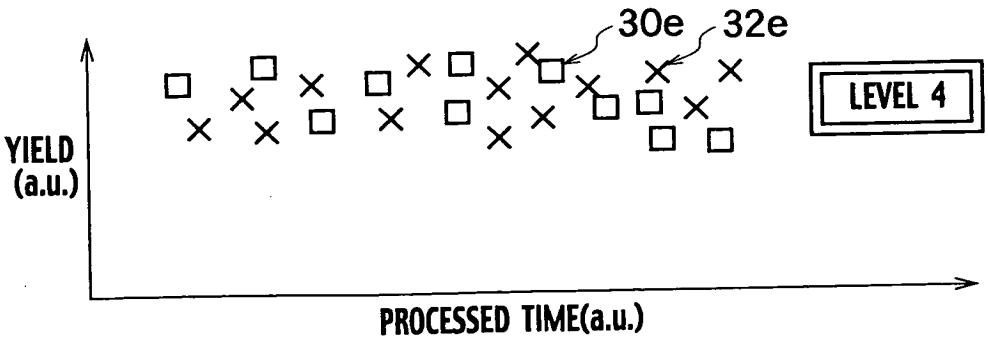

FIG. 11

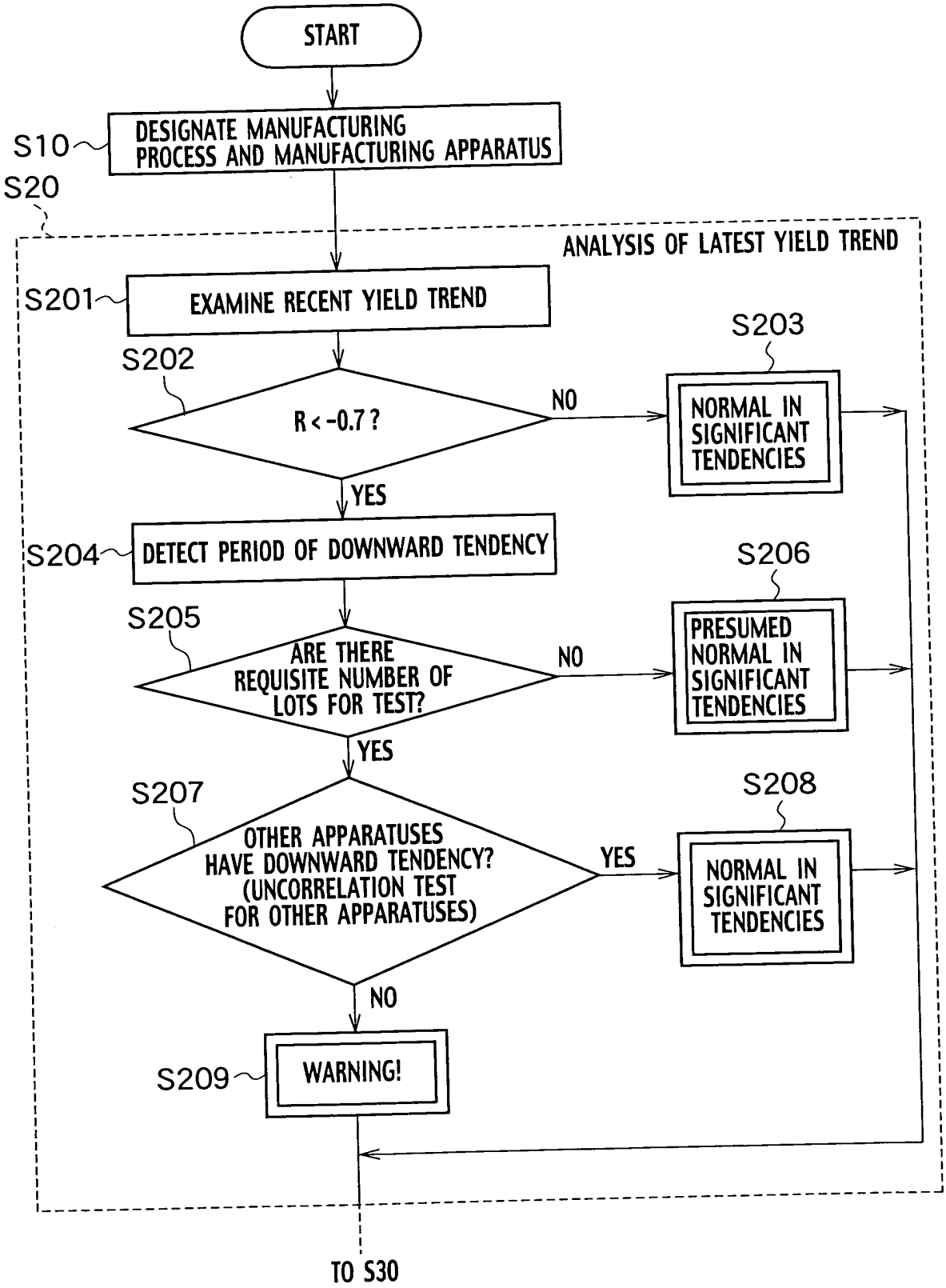
START
S10
DESIGNATE MANUFACTURING PROCESS AND MANUFACTURING APPARATUS
S20
ANALYSIS OF LATEST YIELD TREND
S201
EXAMINE RECENT YIELD TREND
S202
R < -0.7 ?
NO
S203
NORMAL IN SIGNIFICANT TENDENCIES
YES
S204
DETECT PERIOD OF DOWNWARD TENDENCY
S205
ARE THERE REQUISITE NUMBER OF LOTS FOR TEST?
NO
S206
PRESUMED NORMAL IN SIGNIFICANT TENDENCIES
YES
S207
OTHER APPARATUSES HAVE DOWNWARD TENDENCY? (UNCORRELATION TEST FOR OTHER APPARATUSES)
YES
S208
NORMAL IN SIGNIFICANT TENDENCIES
NO
S209
WARNING!
TO S30

FIG. 12

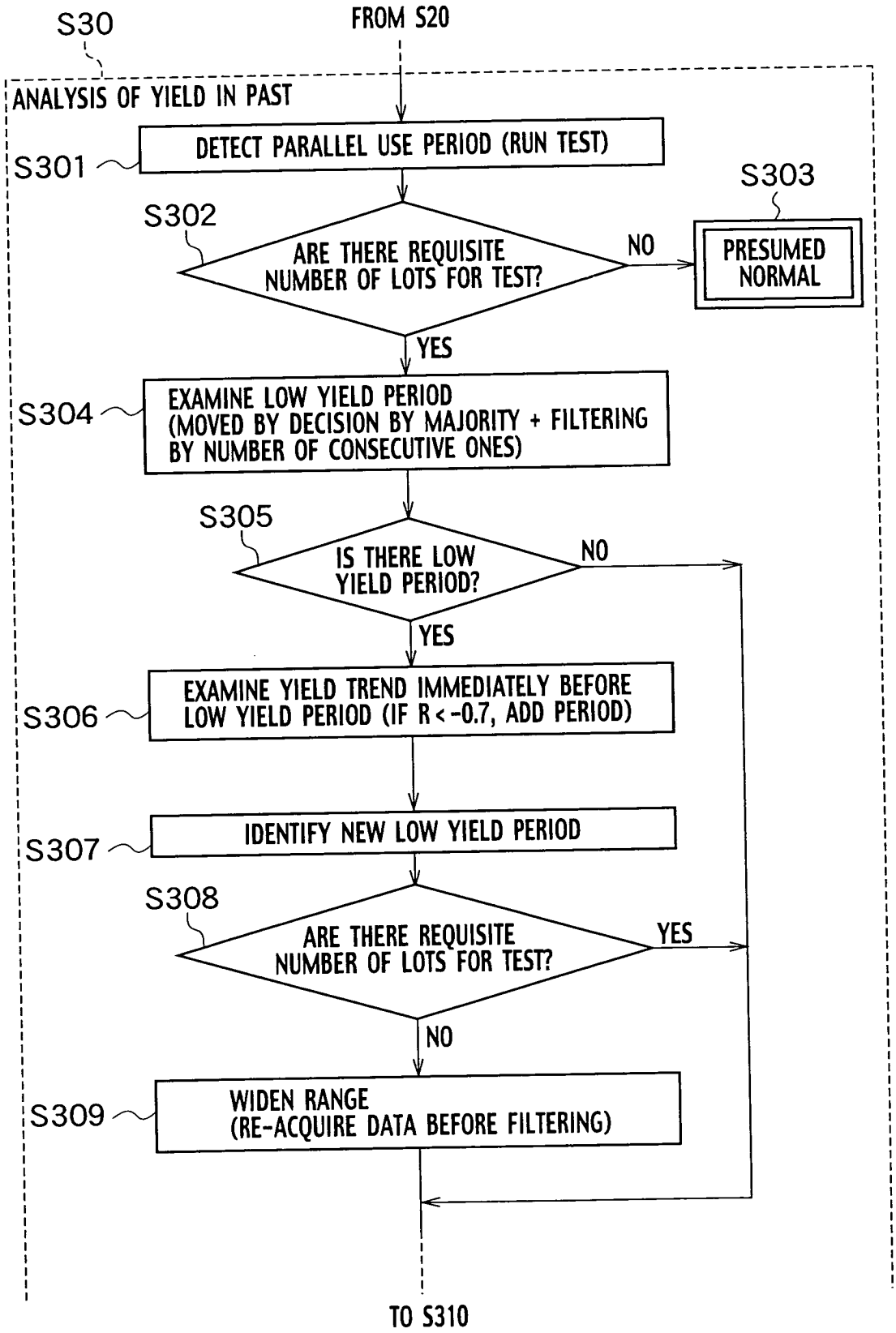
S30
FROM S20
ANALYSIS OF YIELD IN PAST
S301
DETECT PARALLEL USE PERIOD (RUN TEST)
S302
ARE THERE REQUISITE NUMBER OF LOTS FOR TEST?
NO
S303
PRESUMED NORMAL
YES
S304
EXAMINE LOW YIELD PERIOD (MOVED BY DECISION BY MAJORITY + FILTERING BY NUMBER OF CONSECUTIVE ONES)
S305
IS THERE LOW YIELD PERIOD?
NO
YES
S306
EXAMINE YIELD TREND IMMEDIATELY BEFORE LOW YIELD PERIOD (IF R<-0.7, ADD PERIOD)
S307
IDENTIFY NEW LOW YIELD PERIOD
S308
ARE THERE REQUISITE NUMBER OF LOTS FOR TEST?
YES
NO
S309
WIDEN RANGE (RE-ACQUIRE DATA BEFORE FILTERING)
TO S310

FIG. 13

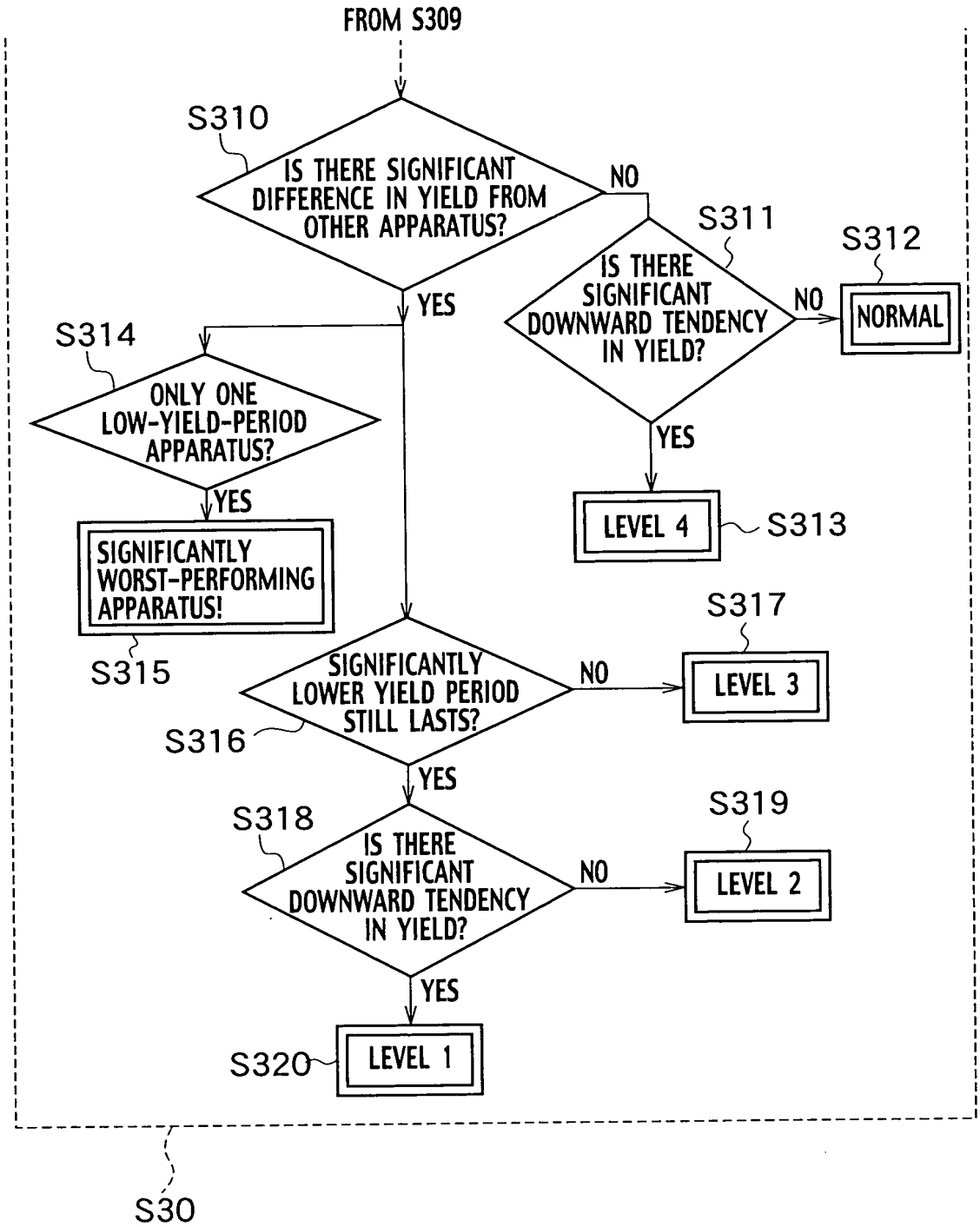
FROM S309
S310
IS THERE SIGNIFICANT DIFFERENCE IN YIELD FROM OTHER APPARATUS?
NO
YES
S311
IS THERE SIGNIFICANT DOWNWARD TENDENCY IN YIELD?
NO
S312
NORMAL
YES
LEVEL 4
S313
S314
ONLY ONE LOW-YIELD-PERIOD APPARATUS?
YES
SIGNIFICANTLY WORST-PERFORMING APPARATUS!
S315
S316
SIGNIFICANTLY LOWER YIELD PERIOD STILL LASTS?
NO
S317
LEVEL 3
YES
S318
IS THERE SIGNIFICANT DOWNWARD TENDENCY IN YIELD?
NO
S319
LEVEL 2
YES
S320
LEVEL 1
S30

FIG. 14

PARAMETER	PROCESS	APPARATUS	AVERAGE	MEDIAN	LOT	RESULT	p-VALUE (SIGNIFICANT DIFFERENCE FROM OTHER APPARATUS)	SIGNIFICANT WORST APPARATUS/NOT	SIGNIFICANTLY LOWER YIELD PERIOD	SIGNIFICANT DOWNWARD TENDENCY IN RECENT YIELD	CORRELATION COEFFICIENT R
ALL-BIT GOOD PRODUCT RATE	DR24	DF10	85.77	86.619	92	LEVEL3	0.001272916	SIGNIFICANT WORST APPARATUS	NONE	NONE	
ALL-BIT GOOD PRODUCT RATE	R4V4	RI03	85.796	86.775	50	LEVEL3	0.004284372	SIGNIFICANT WORST APPARATUS	RECOVERED	NONE	
ALL-BIT GOOD PRODUCT RATE	CT24	CP01	84.636	83.435	8	LEVEL3	0.008150972	SIGNIFICANT WORST APPARATUS	RECOVERED	NONE	
D/S YIELD	AAA4	AX06	92.662	93.223	15	LEVEL2	0.009073151	SIGNIFICANT WORST APPARATUS	CONTINUED	NONE	
D/S YIELD	WGC2	JB03	92.805	93.141	20	LEVEL2	0.002312551	SIGNIFICANT WORST APPARATUS	CONTINUED	NONE	
D/S YIELD	DR24	DF10	92.921	93.742	92	LEVEL3	0.001645522	SIGNIFICANT WORST APPARATUS	NONE	NONE	
D/S YIELD	OCS3	QP44	92.781	92.805	16	LEVEL3	0.001496344	SIGNIFICANT WORST APPARATUS	RECOVERED	NONE	
D/S YIELD	RM14	RC04	92.631	93.456	34	LEVEL3	0.009374769	SIGNIFICANT WORST APPARATUS	RECOVERED	NONE	
D/S YIELD	R4V4	RI03	92.987	93.477	50	LEVEL3	0.009740123	SIGNIFICANT WORST APPARATUS	RECOVERED	NONE	
D/S YIELD	PM44	PV01	93.602	93.871	44	LEVEL3	0.003759372	SIGNIFICANT WORST APPARATUS	RECOVERED	NONE	
D/S YIELD	CT24	CP01	92.25	92.242	8	LEVEL3	0.005575765	SIGNIFICANT WORST APPARATUS	RECOVERED	NONE	
DC-Yield	Q2V5	QV63	98.402	98.474	29	LEVEL3	0.008005144	SIGNIFICANT WORST APPARATUS	RECOVERED	NONE	
FUNCTION YIELD	AAA4	AX06	93.198	93.619	15	LEVEL2	0.009658828	SIGNIFICANT WORST APPARATUS	CONTINUED	NONE	
FUNCTION YIELD	DR24	DF10	93.348	94.006	92	LEVEL3	0.002022407	SIGNIFICANT WORST APPARATUS	NONE	NONE	
FUNCTION YIELD	OCS3	QP44	93.191	93.256	16	LEVEL3	0.002373451	SIGNIFICANT WORST APPARATUS	RECOVERED	NONE	
ALL-BIT GOOD PRODUCT/DEFECTIVE PRODUCT RATIO	DR24	DF10	14.23	13.381	92	LEVEL3	0.001272916	SIGNIFICANT WORST APPARATUS	NONE	NONE	
ALL-BIT GOOD PRODUCT/DEFECTIVE PRODUCT RATIO	R4V4	RI03	14.204	13.225	50	LEVEL3	0.004284372	SIGNIFICANT WORST APPARATUS	RECOVERED	NONE	
ALL-BIT GOOD PRODUCT/DEFECTIVE PRODUCT RATIO	CT24	CP01	15.364	16.565	8	LEVEL3	0.008150972	SIGNIFICANT WORST APPARATUS	RECOVERED	NONE	
D/S DEFECTIVE PRODUCT RATE	AAA4	AX06	7.338	6.7773	15	LEVEL2	0.009073151	SIGNIFICANT WORST APPARATUS	CONTINUED	NONE	
D/S DEFECTIVE PRODUCT RATE	WGC2	JB03	7.1945	6.8589	20	LEVEL2	0.002312551	SIGNIFICANT WORST APPARATUS	CONTINUED	NONE	
D/S DEFECTIVE PRODUCT RATE	DR24	DF10	7.0786	6.2583	92	LEVEL3	0.001645522	SIGNIFICANT WORST APPARATUS	NONE	NONE	
D/S DEFECTIVE PRODUCT RATE	OCS3	QP44	7.2189	7.1952	16	LEVEL3	0.001496344	SIGNIFICANT WORST APPARATUS	RECOVERED	NONE	
D/S DEFECTIVE PRODUCT RATE	RM14	RC04	7.3686	6.544	34	LEVEL3	0.009374769	SIGNIFICANT WORST APPARATUS	RECOVERED	NONE	
D/S DEFECTIVE PRODUCT RATE	R4V4	RI03	7.0132	6.5225	50	LEVEL3	0.009740123	SIGNIFICANT WORST APPARATUS	RECOVERED	NONE	
D/S DEFECTIVE PRODUCT RATE	PM44	PV01	6.3977	6.1289	44	LEVEL3	0.003759372	SIGNIFICANT WORST APPARATUS	RECOVERED	NONE	
D/S DEFECTIVE PRODUCT RATE	CT24	CP01	7.7502	7.7578	8	LEVEL3	0.005575765	SIGNIFICANT WORST APPARATUS	RECOVERED	NONE	

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DOCKET #: 243329US2
INV.: Kenichi KADOTA
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FIG. 15A

PROCESS	R4V4	
APPARATUS	RI03	
DETERMINATION	LEVEL3	
p-VALUE (SIGNIFICANT DIFFERENCE FROM OTHER APPARATUS)	0.004284372	
SIGNIFICANT WORST APPARATUS/NOT	SIGNIFICANT WORST APPARATUS	
SIGNIFICANTLY LOWER YIELD PERIOD	RECOVERED	
SIGNIFICANT DOWNWARD TENDENCY IN RECENT YIELD	NONE	←CORRELATION COEFFICIENT R

FIG. 15B

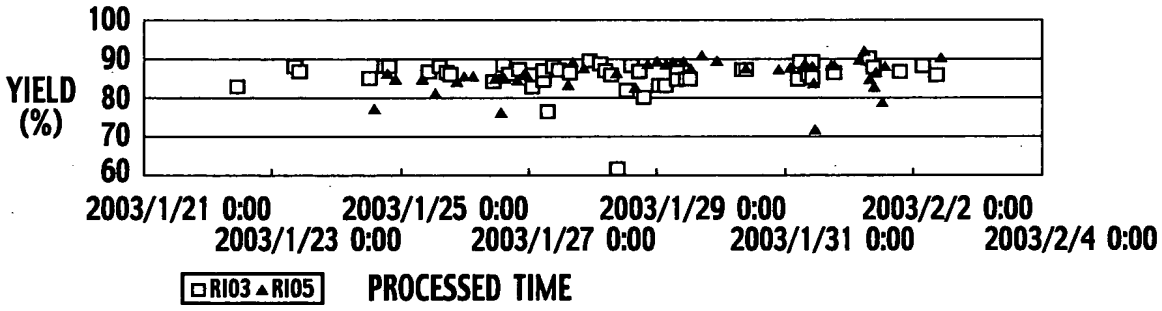
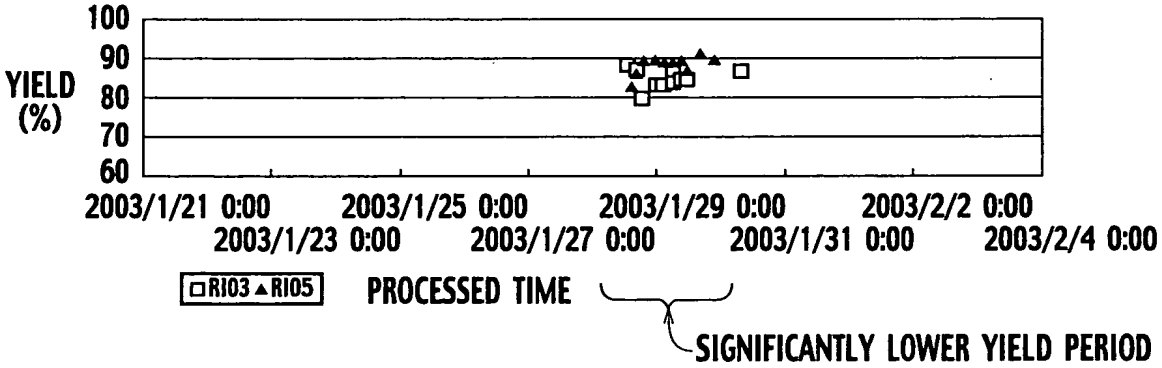
FIG. 15C